

General Description

The RxM73WR12 was developed to satisfy the receiver requirements of a complex (I/Q) modulation, micro-controller-based, Gigabit E-Band radio terminal.

A single RxM73WR12 receiver module, teamed with a single TxM73WR12 transmitter module and appropriate antennas, can serve as the complete RF section of a low-power Gigabit simplex radio.

A full-duplex FDD radio operating in the 71-76/81-86 GHz bands can be realized by using one RxM73WR12 Rx module, one RxM83WR12 Rx module, one TxM73WR12 Tx module, and one TxM83WR12 Tx module with appropriate duplexers and antennas (see Figure 2).

For maximum operating range, an ultra low noise preamplifier can be easily attached to the RxM73WR12 input interface (WR-12 with UG-387/U-compatible flange).

Key operational parameters are programmed via a 4-wire Serial Peripheral Interface (SPI).

Features

- Direct down-conversion from 71-76 GHz
- Supports up to 3 Gbps, full-duplex data rate
- Supports 1 GHz channel spacing for QPSK to 128 QAM typ.
- Noise Figure (DSB): 9.5 dB typ.
- Input P-1dB: -14 dBm typ.
- Differential I/Q outputs
- SPI interface controls Rx on/off and temperature sensor output
- Low phase noise, internal VCO Local Oscillator
 - VCO tune input and divided-down output for connecting to external PLL circuitry
 - SSB phase noise (typ.):
 - -84 dBc/Hz @ 100 KHz offset
 - -105 dBc/Hz @ 1 MHz offset
 - -125 dBc/Hz @ 10 MHz offset
- Single voltage DC Bias: +6V @ 0.5A typ.

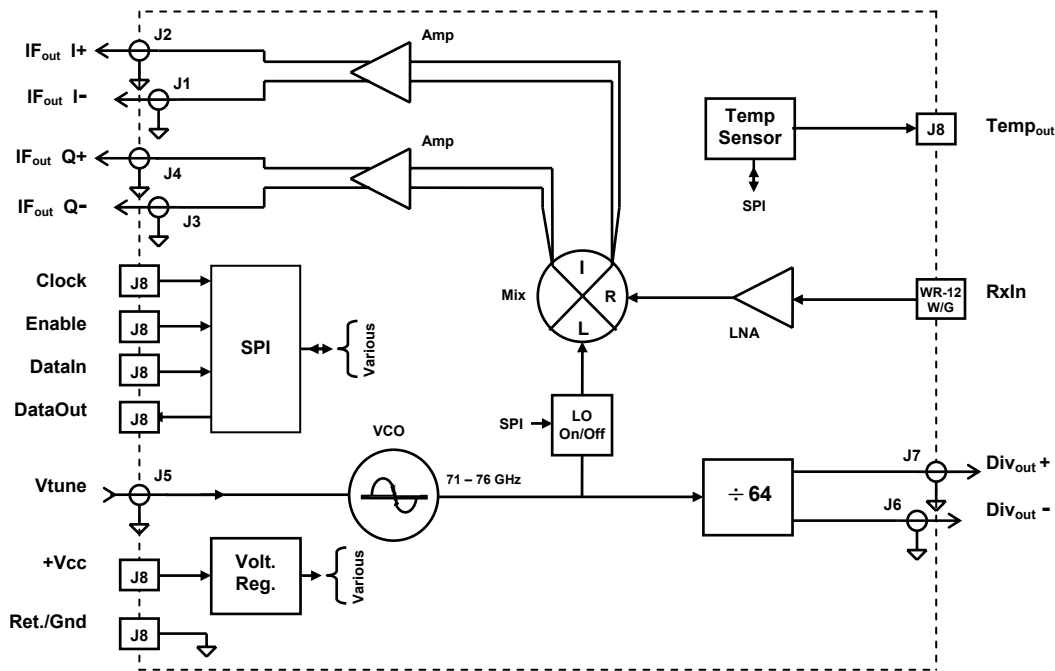


Figure 1 – RxM73WR12 Functional Block Diagram

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Functional Characteristics		
Mnemonic	Conn.	Description
+Vcc	J8	DC bias input requirement: 6.0 ± 5% VDC @ 0.5A typ.
Vtune	J5	VCO tune voltage for 71-76 GHz output = 0.5 to 4.0V typ.
DataOut	J8	SPI data sequence from Receiver; CMOS/TTL compatible
DataIn	J8	SPI data sequence to Receiver; CMOS/TTL compatible
Enable	J8	SPI On/Off control signal to Receiver; CMOS/TTL compatible
Clock	J8	SPI clock to Receiver; CMOS/TTL compatible
IFout Q-	J3	Differential Quadrature-phase outputs; impedance: 100Ω differential (50Ω single-ended); bandwidth (each channel) = 500 MHz min./1 GHz typ., AC-coupled
IFout Q+	J4	
IFout I-	J1	Differential In-phase outputs; impedance: 100Ω differential (50Ω single-ended); bandwidth (each channel) = 500 MHz min./1 GHz typ., AC-coupled
IFout I+	J2	
TempOut	J8	Temperature sensor output (DC voltage)
RxIn	W/G	Receiver input: WR-12 with UG-387/U compatible flange; -50 dBm typ. LO residual power at Rx input
Divout+	J7	Frequency ≈ 1.11 GHz to 1.19 GHz; impedance: 100Ω differential (50Ω single-ended); output (typ.) = -9 dBm differential (-12 dBm single-ended)
Divout-	J6	
Operating temperature range = -35 to 65 deg. C		
Storage temperature range = -40 to 75 deg. C		

Note – Differential signaling provides several performance improvements vs. single-ended signaling, including reduced radiated noise pickup, reduced 2nd order distortion products, and doubled signal amplitudes. A/D converters (which the I/Q outputs ultimately drive in the Digital Signal Processor), generally utilize differential inputs.

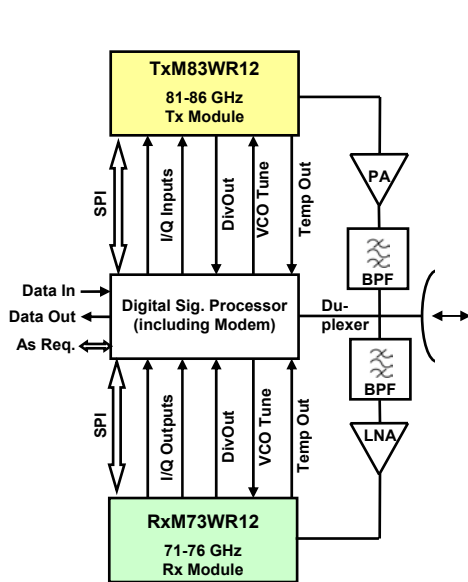


Figure 2 – Full-Duplex E-Band Radio Terminal Baseline Design

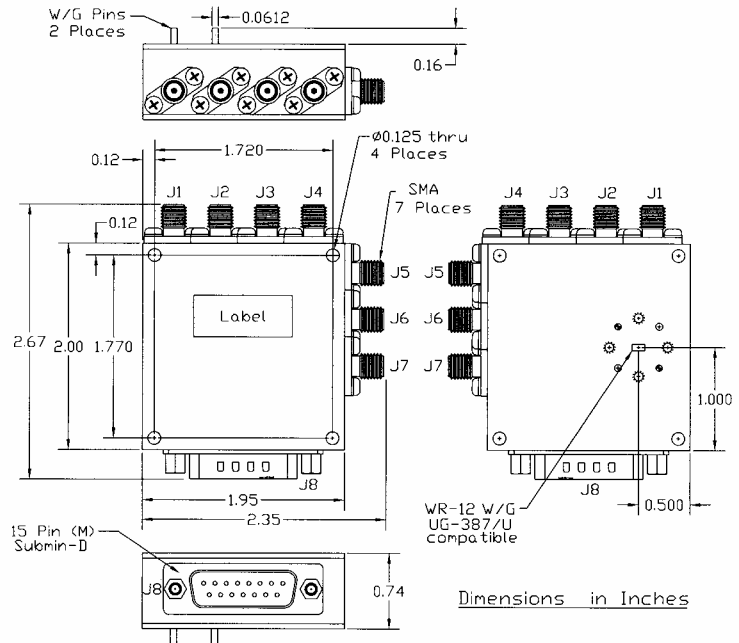


Figure 3 – RxM73WR12 Outline